

**D.) AMENDMENTS TO THE DRAWINGS**

None.

### **E.) REMARKS**

This Response is filed in response to the Office Action dated June 6, 2006.

Upon entry of this Response, claims 1-20 and 28-31 will be pending in the Application.

In the outstanding Office Action, the Examiner rejected claims 1-20 and 28-31 under 35 U.S.C. 112, second paragraph, as being indefinite; rejected claims 1, 5-11, 14, 15, 17, 18 and 28-31 under 35 U.S.C. 102(b) as being anticipated by Hillig et al. (U.S. Patent No. 4,917,941) hereinafter "Hillig"; rejected claims 1, 6, 8-11 and 15 under 35 U.S.C. 102(b) as being anticipated by Fareed et al. (U.S. Publication No. 2002/0058107) hereinafter "Fareed"; rejected claims 1-18 and 28-31 under 35 U.S.C. § 103(a) as being unpatentable over Tani (U.S. Publication No. 2003/0145934) hereinafter "Tani" in view of Hillig and rejected claims 19 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Tani in view of Hillig in further view of Colegrove et al. (U.S. Patent No. 6,096,669) hereinafter "Colegrove".

Independent claims 1 and 28 have been amended to better define the invention, i.e., a preform for constructing a ceramic matrix composite laminate including a porous nonwoven mat compressively interposed between adjacent preformed continuous fiber lamina of the plurality of preform lamina while the nonwoven mat is dry, the nonwoven mat forming an interface between the continuous fiber lamina having reduced voids.

#### **Rejection under 35 U.S.C. 102**

##### **A. Claims 1, 5-11, 14, 15, 17, 18 and 28-31**

The Examiner rejected claims 1, 5-11, 14, 15, 17, 18 and 28-31 under 35 U.S.C. 102(b) as being anticipated by Hillig.

### Specifically, the Examiner stated that

- a. Hillig et al. teach a fiber and a filament containing ceramic portions comprised of a mixture of discontinuous fibers surrounding a layer of continuous filaments extending through the mixture. The mixture is produced by and infiltrated with a matrix ceramic to produce a composite (Abrusac). The continuous fibers provide reserve strength to the composite should it crack and the discontinuous fibers provide toughness to the composite (col. 1, line 61-col. 2, line 12). The discontinuous fibers may be chopped silicon carbide fibers or a mixture of different ceramic fibers (col. 3, lines 1-29). The continuous fibers may be made of silicon carbide or a mixture of different ceramic fibers (col. 3, lines 43-49). As demonstrated in the Examples of Hillig the final product of Hillig is dry and porous and therefore anticipates the new limitations.
- b. The structure of the applied article has a layer containing a plurality of continuous ceramic filaments adjacent a layer of chopped ceramic fibers located in a continuous matrix phase which is adjacent another layer containing a plurality of continuous ceramic filaments (claim 5). A number of chemical species are available for use as the infiltrant to create the continuous matrix including ceramics (col. 4, lines 3-14). The Examiner takes the position that the chopped ceramic fibers that are located in the applied invention's matrix constitute a nonwoven mat of chopped fibers. This is based upon the fact that the matrix contains a plurality of fibers, which are bound together by the matrix creating a mat. Therefore, the applied article constitutes a plurality of continuous ceramic fiber layers (laminae) each separated by a layer of ceramic matrix that has a nonwoven mat layer of chopped ceramic fibers within it. The continuous matrix phase is to be distributed evenly throughout the composite to create the instantly claimed infiltrated article (col. 11, lines 6-13). Claim 5 is rejected as the ceramic fibers may have a length of from about 19 to about 2000 microns (0.0004 to 0.08 inches) (col. 3, lines 13-15). Claim 14 is rejected as the ceramic chopped fibers have diameters up to 10 microns (0.0004 inches) (col. 3, lines 10-15).
- c. Claims 8-11 are rejected as the matrix phase of the applied invention is designed to fill the space between adjacent layers of continuous filaments thereby reducing the number of inter-laminar voids, size and volume fraction of said voids. The continuous matrix is to be distributed evenly throughout the composite and as such would evenly distribute the inter-laminar voids.

Applicants respectfully traverse the rejection of claims 1, 5-11, 14, 15, 17, 18 and 27 under 35 U.S.C. 102(b).

Hillig, as understood, is directed to a fiber and filament-containing preform containing a mixture of discontinuous fibers and particulates surrounding a layer of continuous filaments. The mixture of discontinuous fibers and particulates are applied in the form of a suspension.

In contrast, independent claim 1 recites a preform for constructing a ceramic matrix composite laminate comprising a plurality of preform lamina, each of the preform lamina being formed of directional continuous ceramic fiber; a porous layer of nonwoven mat including a plurality of chopped ceramic fibers, the nonwoven mat being compressively interposed between adjacent preformed continuous fiber lamina of the plurality of preform lamina while the nonwoven mat is dry, the nonwoven mat forming an interface between the continuous fiber lamina having reduced voids.

In contrast, independent claim 28 recites a preform for constructing a ceramic matrix composite laminate comprising a plurality of preform lamina, each of the preform lamina being formed of directional continuous ceramic fiber; a porous layer of nonwoven mat including a plurality of randomly oriented chopped ceramic fibers, the nonwoven mat being compressively interposed between adjacent preformed continuous fiber lamina of the plurality of preform lamina while the nonwoven mat is dry, the nonwoven mat forming an interface between the continuous fiber lamina having reduced voids.

The examiner is reminded that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).” *See* Manual of Patent Examining Procedure, 8<sup>th</sup> Edition (MPEP), Section 2131.

In addition, “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).” *See* MPEP, Section 2131.

Several of the features recited by Applicant in independent claims 1 and 28, as amended, are not taught or suggested by Hillig. First, Hillig does not teach or suggest a mat as recited by Applicant in independent claim 1. Hillig discloses producing a suspension of a mixture of ceramic fibers and particulates in a liquid vehicle, or alternately, removing a sufficient amount of liquid vehicle from the suspension to produce a moldable mass which is molded to form a first layer of a molded compact. In either event, neither Hillig construction can be properly considered a mat. *Merriam-Webster's Collegiate Dictionary, Tenth Edition* defines a mat as a piece of coarse, woven, plaited, or felted fabric used especially as a floor covering or a support, or something made up of densely tangled or adhering strands especially of organic matter. Accordingly, neither a suspension nor a moldable mass can be properly considered a mat.

Merely for reasons of argument, if somehow the Hillig construction could be considered a mat, which it isn't, then Hillig certainly cannot be properly considered a dry, porous layer of nonwoven mat, as recited in claims 1 and 28. That is, claim 1, recites a porous layer of nonwoven mat is provided and interposed between adjacent preformed continuous fiber lamina while the nonwoven mat is dry, without other materials to fill the porosity of the mat. Paragraph [0022] of the Specification of the present invention provides that only a bonding agent, such as polyvinyl alcohol, is mixed with the fibers, but after the fibers are pulled into a thin fabric layer, the layer is dried, removing the bonding agent, which removal occurring prior to using the mat to form the ceramic matrix composite laminate. In contrast, both of the embodiments of Hillig are suspensions, with the second suspension embodiment having sufficient liquid removed to produce a moldable mass, the suspension layers being applied while still moist. Therefore, Hillig is not only not dry, but saturated with liquid, which means the Hillig suspension constructions are also not considered porous.

Thus, since Hillig does not teach or suggest all of the limitations recited in independent claim 1, Applicant respectfully submits that Hillig does not anticipate Applicant's invention as recited in independent claim 1.

Therefore, for the reasons given above, independent claims 1 and 28 are believed to be distinguishable from Hillig and therefore are not anticipated nor rendered obvious by Hillig.

Dependent claims 5-11, 14, 15, 17, 18 and 29-31 are believed to be allowable as depending from what are believed to be allowable independent claims 1 and 28 for the reasons given above. In addition, claims 5-11, 14, 15, 17, 18 and 29-31 recite further limitations that distinguish over the applied art. In conclusion, it is respectfully submitted that claims 1, 5-11, 14, 15, 17, 18 and 28-31 are not anticipated nor rendered obvious by Hillig and are therefore allowable.

**B. Claims 1, 6, 8-11 and 15**

The Examiner rejected claims 1, 6, 8-11 and 15 under 35 U.S.C. 102(b) as being anticipated by Fareed.

Specifically, the Examiner stated that

- a. Fareed et al teach a composite comprising adjacent plies of fiber tows/bundles (e.g., silicon carbide fiber) separated by a continuous ceramic matrix [0122, 0123]. Within the matrix, chopped silicon carbide fibers may be added [0126]. The Examiner takes the position that the chopped ceramic fibers that are located in the applied invention's matrix constitute a nonwoven mat of chopped fibers. This is based upon the fact that the matrix contains a plurality of fibers, which are bound together by the matrix creating a mat. Therefore, the applied article constitutes a plurality of continuous ceramic fiber layers (laminae) each separated by a layer of ceramic matrix that has a nonwoven mat layer of chopped ceramic fibers within it.
- b. Claims 8-11 are rejected as the matrix phase of the applied invention is designed to fill the space in between adjacent layers of continuous filaments thereby reducing the number of inter-laminar voids, size and volume fraction of said voids. The continuous matrix is to be distributed evenly throughout the composite and as such would evenly distribute the inter-laminar voids.

Applicants respectfully traverse the rejection of claims 1, 6, 8-11 and 15 under 35 U.S.C. 102(b).

Fareed, as understood, is directed to a composite comprising adjacent plies of fiber tows/bundles separated by a matrix of materials having a coefficient thermal expansion that is closer in value to the coefficient thermal expansion of the fiber plies than previous constructions.

The matrix includes silicon carbide particulates, but can also use platelets, whiskers or chopped fibers.

In contrast, independent claim 1 recites a preform for constructing a ceramic matrix composite laminate comprising a plurality of preform lamina, each of the preform lamina being formed of directional continuous ceramic fiber; a porous layer of nonwoven mat including a plurality of chopped ceramic fibers, the nonwoven mat being compressively interposed between adjacent preformed continuous fiber lamina of the plurality of preform lamina while the nonwoven mat is dry, the nonwoven mat forming an interface between the continuous fiber lamina having reduced voids.

The examiner is reminded that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).” See Manual of Patent Examining Procedure, 8<sup>th</sup> Edition (MPEP), Section 2131.

In addition, “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).” See MPEP, Section 2131.

Several of the features recited by Applicant in independent claim 1, as amended, are not taught or suggested by Fareed. First, Fareed does not teach or suggest a porous mat as recited by Applicant in independent claim 1. Fareed first discloses introducing into the matrix one or more materials having a relatively low coefficient of thermal expansion, i.e., lower than the matrix material, such as silicon carbide particulate. Additionally, other forms of silicon carbide can be used, such as platelets, whiskers or chopped fibers. In other words, since the matrix in Fareed surrounds the added materials introduced into the matrix, the resulting mixture cannot be considered porous. In the present invention, the nonwoven fibers are mixed with a bonding agent, such as polyvinyl alcohol, and then pulled into a thin fabric layer, which is then dried, removing the bonding agent, leaving only the “fluffy” nonwoven fabric layer. See paragraph [0022]. In addition, Fareed does not teach or suggest that the matrix with the silicon carbide is presented in the form of a mat, since neither the word mat nor language suggesting a mat appears

in Fareed. Therefore, it is improper for the Examiner to characterize the matrix as a mat. *Merriam-Webster's Collegiate Dictionary*, Tenth Edition defines a mat as a piece of coarse, woven, plaited, or felted fabric used especially as a floor covering or a support, or something made up of densely tangled or adhering strands especially of organic matter, such as a mat of hair. In other words, for the matrix in Fareed to possibly be considered a mat, a considerable amount of fibers must outwardly protrude from the matrix material. Not only is there no disclosure that this indeed is the case, but such a configuration provides no benefit in the Fareed construction because for the benefit of the matrix mixed with fibers or particulates to be realized, the particulates must be mixed within the matrix material so as to reduce the coefficient of thermal expansion.

Thus, since Fareed does not teach or suggest all of the limitations recited in independent claim 1, Applicant respectfully submits that Fareed does not anticipate Applicant's invention as recited in independent claim 1.

Therefore, for the reasons given above, independent claim 1 is believed to be distinguishable from Fareed and therefore is not anticipated nor rendered obvious by Fareed.

Dependent claims 6, 8-11 and 15 are believed to be allowable as depending from what is believed to be allowable independent claim 1 for the reasons given above. In addition, claims 6, 8-11 and 15 recite further limitations that distinguish over the applied art. In conclusion, it is respectfully submitted that claims 1, 6, 8-11 and 15 are not anticipated nor rendered obvious by Fareed and are therefore allowable.

### **Rejection under 35 U.S.C. 103**

#### **A. Claims 1-18 and 28-31**

The Examiner rejected claims 1-18 and 28-31 under 35 U.S.C. § 103(a) as being unpatentable over Tani in view of Hillig.

Specifically, the Examiner stated that



- a. Tani teaches a process for producing a fiber-reinforced silicon carbide composite offering high toughness comprising a multiple layer laminate (Abstract). Woven, nonwoven and unidirectional prepregs of silicon carbide fiber are available to reinforce the silicon carbide matrix [0014, 0015]. The spaces between the layers of the composite are filled with polymeric resin and silicon. Following heat-treatment the two components form a porous silicon carbide matrix spanning the void between adjacent layers of the laminate (Abstract, 0006). The laminate of Example 3 comprises two layers of nonwoven and two layers of woven silicon carbide fabrics laminated in alternating order creating a laminar combination of nonwoven/woven/nonwoven/woven. Unidirectional fiber prepregs, which comprise continuous fibers, may replace the woven fabric layers [0014]. Replacing the woven fabric layers of Example 3 with unidirectional fiber prepreg layers creates a ceramic matrix composite laminate with a nonwoven layer in between two layers of unidirectional fiber prepreg. The invention of Tani is silent as to the use of chopped ceramic fibers in the creation of the nonwoven fabric layer.
- b. Hildig et al. teach a fiber and a filament containing ceramic perform comprised of a mixture of discontinuous fibers surrounding a layer of continuous filaments extending through the mixture. The mixture is produced by and infiltrated with a molten ceramic to produce a composite (Abstract). The continuous fibers provide reserve strength to the composite should it crack and the discontinuous fibers provide toughness to the composite (col. 1, line 61-col. 2, line 12). The discontinuous fibers may be chopped silicon carbide fibers or a mixture of different ceramic fibers (col. 3, lines 1-20). The continuous fibers may be made of silicon carbide or a mixture of different ceramic fibers (col. 5, lines 43-49).
- c. The structure of the applied article has a layer containing a plurality of continuous ceramic filaments adjacent a layer of chopped ceramic fibers located in a continuous matrix phase which is adjacent another layer containing a plurality of continuous ceramic filaments (claim 5). A number of chemical species are available for use as the infiltrant to create the continuous matrix including ceramics (col. 4, lines 1-14). The continuous

matrix phase is to be distributed evenly throughout the composite to create the instantly claimed infiltrated article (col. 11, lines 6-13). Claim 5 is rejected as the ceramic fibers may have a length of from about 10 to about 2000 microns (0.0004 to 0.08 inches) (col. 3, lines 13-15). Claim 14 is rejected as the ceramic chopped fibers have diameters up to 10 microns (0.0004 inches) (col. 3, lines 16-15).

d. Claims 8-11 are rejected as the matrix phase of the applied invention is designed to fill the space between adjacent layers of continuous filaments thereby reducing the number of inter-laminar voids, size and volume fraction of said voids. The continuous matrix is to be distributed evenly throughout the composite and as such would evenly distribute the inter-laminar voids.

e. Since Tani and Hillig et al. are from the same field of endeavor (i.e. fiber-reinforced silicon carbide composites), the purpose disclosed by Hillig et al. would have been recognized in the pertinent art of Tani.

f. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to have made the nonwoven layers of Tani with the chopped ceramic fibers of Hillig et al. The skilled artisan would have been motivated by the desire to provide the composite with toughness (col. 1, line 61-col. 2, line 12, Hillig et al.).

g. Tani and Hillig et al. disclose the claimed invention except for the instantly claimed nonwoven mat thickness. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the nonwoven mat layer between 0.001 and 0.002 inches thick, since it has been held that where the general

conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Alder*, 165 USPQ 233. Therefore, claims 2 and 3 are rejected.

b. Claim 4 is rejected as it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the nonwoven mat layer with randomly oriented chopped fibers. The skilled artisan would have been motivated to use said fibers, because randomly oriented fibers within the continuous matrix would have afforded the matrix thermal, mechanical, and electrical enhancement that is isotropic. Isotropic properties afford the nonwoven layer minimized thermal and mechanical stresses that occur when there is a mismatch between phases of a composite.

i. Tani and Hellig et al. disclose the claimed invention except for the instantly claimed nonwoven mat porosity. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the nonwoven mat layer with porosity of about 80 to 90 percent, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Alder*, 165 USPQ 233. Therefore, claims 12 and 13 are rejected.

Applicants respectfully traverse the rejection of claims 1-18 and 28-31 under 35 U.S.C. § 103(a).

The previous discussion of Hellig is equally applicable herein.

Tani, as understood, is directed to a process of producing a multi-layer fiber-reinforced silicon carbide composite having an amount of toughness.

In contrast, independent claim 1 recites a preform for constructing a ceramic matrix composite laminate comprising a plurality of preform lamina, each of the preform lamina being formed of directional continuous ceramic fiber; a porous layer of nonwoven mat including a plurality of chopped ceramic fibers, the nonwoven mat being compressively interposed between adjacent preformed continuous fiber lamina of the plurality of preform lamina while the

nonwoven mat is dry, the nonwoven mat forming an interface between the continuous fiber lamina having reduced voids.

In contrast, independent claim 28 recites a preform for constructing a ceramic matrix composite laminate comprising a plurality of preform lamina, each of the preform lamina being formed of directional continuous ceramic fiber; a porous layer of nonwoven mat including a plurality of randomly oriented chopped ceramic fibers, the nonwoven mat being compressively interposed between adjacent preformed continuous fiber lamina of the plurality of preform lamina while the nonwoven mat is dry, the nonwoven mat forming an interface between the continuous fiber lamina having reduced voids.

Several of the features recited by Applicant in independent claims 1 and 28 are not taught or suggested by Tani or Hillig. First, neither Tani nor Hillig teaches or suggests a dry, porous layer of nonwoven mat including a plurality of chopped ceramic fibers. Tani teaches nonwoven fibers to the extent that the fibers are transversely laid sheet-like unidirectional fiber prepregs, which include matrix material. The Examiner states that Tani is silent as to the use of chopped fibers. In other words, the Examiner is conceding that Tani does not teach or suggest the use of chopped fibers. The Examiner cites Example 3 of Tani to show that two layers each of nonwoven fibers and woven fibers can be alternately applied. While Example 3 may show the alternate application, what the Examiner fails to note is that each pair of plies has already been laminated in resin, so that the fiber layers are nonporous, and that none of the plies include chopped ceramic fibers. For reasons not contained in the Office Action, the Examiner concludes that it would have been obvious to make the nonwoven layers of Tani with the chopped ceramic fibers of Hillig. Although Applicant respectfully disagrees with the Examiner's conclusion, the Examiner's prospective combination of fibers still fails to yield the present invention, since the ceramic fibers of Hillig are moist (not dry) and nonporous.

Furthermore, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination." See Manual of Patent Examining Procedure, 8<sup>th</sup> Edition (MPEP), Section 2143.01.

The Examiner is reminded that “[i]f the proposed modification or combination of the prior art would change the principle or operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.” See MPEP, Section 2143.01.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

See Manual of Patent Examining Procedure, 8<sup>th</sup> Edition (MPEP), Section 2143.03.

For example, as discussed above, even if the nonwoven fabric of Tani were to be added to Hillig, the prospective combination of fibers still fails to yield the present invention, since the ceramic fibers of Hillig are moist (not dry) and nonporous.

Therefore, for the reasons given above, independent claim 1 is believed to be distinguishable from Tani and/or Hillig and therefore is not anticipated nor rendered obvious by Tani and/or Hillig.

Dependent claims 2-18 and 29-31 are believed to be allowable as depending from what are believed to be allowable independent claims 1 and 28 for the reasons given above. In addition, claims 2-18 and 29-31 recite further limitations that distinguish over the applied art. In conclusion, it is respectfully submitted that claims 1-18 and 28-31 are not anticipated nor rendered obvious by Fareed and are therefore allowable.

#### **B. Claims 19-20**

The Examiner rejected claims 19-20 under 35 U.S.C. § 103(a) as being unpatentable over Tani in view of Hillig, and further in view of Colegrove.

Specifically, the Examiner stated that

- a. Colegrove et al. teach a preform suitable for use in creating a composite laminate (Abstract). Figure 5 shows an embodiment of the preform comprising a nonwoven layer 26, resin 8, and unidirectional fiber layer 10. The unidirectional fibers may be silicon carbide (col. 4, lines 24-26) and the nonwoven mat may be made of chopped silicon carbide fibers (col. 4, lines 51-55). Multiple plies of the Colegrove et al. invention may be laminated together (col. 5, lines 49-53). The lamination of two preforms of Figure 5 with the nonwoven layers 26 would result in a symmetric article with two nonwoven layer-adjacent layers of resin 8, and adjacent two layers of unidirectional layers 10.
- b. Since Tani and Colegrove et al. are from the same field of endeavor (i.e., silicon carbide fiber composites), the purpose disclosed by Colegrove et al. would have been recognized in the pertinent art of Tani.
- c. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the article of Tani and Hillig et al. to include multiple layers of the nonwoven mat of Tani between the layers of directional continuous ceramic fibers. The skilled artisan would have been motivated by the desire to create an article that possesses enhanced thermal properties with the inclusion of additional chopped silicon carbide fibers. The enhanced thermal property allows the composite to have a more uniform thermal expansion, thereby decreasing the thermal stresses that buildup due to mismatched coefficient of thermal expansions between its phases.

Applicants respectfully traverse the rejection of claims 19-20 under 35 U.S.C. § 103(a). The previous discussion of Tani and Hillig is equally applicable herein.

Colegrove, as understood, is directed to a preform suitable for resin transfer molding.

Colegrove does not cure the deficiencies of Tani and Hillig, as discussed in further detail above.

Dependent claims 19-20 are believed to be allowable as depending from what is believed to be allowable independent claim 1 for the reasons given above. In addition, claims 19-20 recite further limitations that distinguish over the applied art. In conclusion, it is respectfully submitted that claims 19-20 are not anticipated nor rendered obvious by Tani, Hillig, Colegrove or their combination and are therefore allowable.

#### **Rejection under 35 U.S.C. 112**

The Examiner rejected claims 1-20 and 28-31 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter

applicant regards as the invention. In response thereto, independent claims 1 and 28, from which the remaining claims depend, have been amended in a manner believed to overcome the Examiner's rejection. More specifically, that a preform for constructing a ceramic matrix composite comprises a porous nonwoven mat, the nonwoven mat that is interposed between adjacent preformed continuous fiber lamina of the plurality of preform lamina while the nonwoven mat is dry. Support for the amendment can be found at least at paragraph [0022].

Therefore, in view of the above, Applicant submits that claims 1-20 and 28-31 are not indefinite and comply with the provisions of 35 U.S.C. 112, second paragraph, and therefore are allowable.

### **CONCLUSION**

In view of the above, Applicant respectfully requests reconsideration of the Application and withdrawal of the outstanding objections and rejections. As a result of the amendments and remarks presented herein, Applicant respectfully submits that claims 1-20 and 28-31 are not anticipated by nor rendered obvious by Hillig, Tani, Fareed and Colegrove or their combination and thus, are in condition for allowance. As the claims are not anticipated by nor rendered obvious in view of the applied art, Applicant requests allowance of claims 1-20 and 28-31 in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicant.

The Commissioner is hereby authorized to charge any additional fees and credit any overpayments to Deposit Account No. 50-1059.

Respectfully submitted,  
**McNEES, WALLACE & NURICK**

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